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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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LOS ANGELES, CA 90067-3024

EXAMINER

GONZALEZ, JULIO C

ART UNIT

PAPER NUMBER

2834

DATE MAILED: 05/02/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/746,600

Applicant(s)

IWATA, HIROKAZU

Examiner

Julio C. Gonzalez

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 December 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 16 January 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the electrode been divided into a plurality of portions as disclosed in claim 7 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 2⁵, 7 and 9-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 2, what is considered a trap mode? What is an anti-symmetric 0th mode? How are those modes related to the electrodes? How specifically the 0th mode anti-symmetric affects the piezoelectric device? It seems like if the anti-symmetric mode causes spurious vibrations, does it? If so, what is the relationship of the anti-symmetric mode with the trapped mode? What advantages provides not having an anti-symmetric mode, more specifically the 0th mode, not becoming a trapped mode?

In claim 5, the central portion is disclosed to have a convex portion, what is meant by a "convex portion"?

In claim 7, the claim discloses that the second electrode is divided (singular), yet claim one discloses a pair of second electrodes (plurality). Are both of the pair of second electrodes been divided or only one electrode of the second electrodes is been divided?

Also, how is an electrode divided into a plurality of portions? When is the process of dividing the electrode been done? Is a single electrode been replaced by two

electrodes? The invention uses a single second electrode (claim 5), is it an embodiment of the invention to use two electrodes instead of just one electrode?

Moreover, an adjustment of frequency is performed in the electrode portions. Is the adjustment done on the electrodes or just part (portions) of the electrodes? If so, how is the adjustment done? How is it possible to adjust just a portion of an electrode? Does the adjustment affects the whole electrode or just the specific portion been adjusted?

What device adjusts the frequency of the portions?

In order to advance prosecution in the merits, the Prior Art will be applied as best understood by the examiner.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 2, 3, 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita et al in view of Novikov and Kaida.

Tomita et al discloses a piezoelectric device having a piezoelectric plate 1 with a main electrode 2a, an electrode 2c surrounding the edge of the main electrode with a gap in between (see figure 9a). Moreover, a trapped mode and anti-symmetric mode been used for the device is disclosed (see abstract & column 13, lines 1-4). However Tomika et al does not disclose that the electrodes are made of different materials.

On the other hand, Novikov discloses for the purpose of improving the accuracy of measurement of amplitude frequency over a wide range of frequency spectrum that the electrodes are made of different materials and have different densities (see abstract).

However, neither Tomika nor Novikov disclose a plurality of electrodes surrounding the main electrode.

On the other hand, Kaida discloses for the purpose of ensuring enough bandwidth for a working piezo resonator, a main electrode 28c, which is surrounded by a plurality of second electrodes (see figures 31B, 29).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to design a piezoelectric device having a main electrode as disclosed by Tomita et al and to modify the invention using different materials for the purpose of improving the accuracy of measurement of amplitude frequency over a wide range of frequency spectrum as disclosed by Novikov and to divide an electrode into a

plurality of portions for the purpose of ensuring enough bandwidth for a working piezo resonator as disclosed by Kaida.

5. Claims 4, 8, 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita et al, Novikov and Kaida as applied to claims 1 and 3 above, and further in view of Wajima.

The combined piezoelectric resonator discloses all of the limitations above. However, the combined piezoelectric resonator does not disclose that the electrodes have an elliptical configuration.

On the other hand, Wajima discloses for the purpose of suppress undesired spurious vibrations, electrodes with an elliptical configuration (see figure 12A).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to design the combined piezoelectric resonator as disclosed above and to modify the invention by using an elliptical configuration for the electrode discloses for the purpose of suppress undesired spurious vibrations as disclosed by Wajima.

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita et al in view of Dydyk.

Tomita et al discloses a piezoelectric device having a piezoelectric plate 1 with a main electrode 2a, an electrode 2c surrounding the edge of the main electrode with a

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gap in between (see figure 9a). Moreover, a trapped mode and anti-symmetric mode been used for the device is disclosed (see abstract & column 13, lines 1-4).

However Tomika et al does not disclose that the main surface has a recess corresponding to a thin portion.

On the other hand, Dydyk discloses for the purpose of providing a robust resonator having high quality factor and low insertion loss that a piezoelectric plate can have a recess to thereby form a thin portion (see figure 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to design a piezoelectric device having a main electrode as disclosed by Tomita et al and to modify the invention by making a recess to a piezoelectric device for the purpose of providing a robust resonator having high quality factor and low insertion loss as disclosed by Dydyk.

7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita et al and Dydyk as applied to claim 5 above, and further in view of Wajima.

The combined piezoelectric resonator discloses all of the limitations above. However, the combined piezoelectric resonator does not disclose that the electrodes have an elliptical configuration.

On the other hand, Wajima discloses for the purpose of suppress undesired spurious vibrations, electrodes with an elliptical configuration (see figure 12A).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to design the combined piezoelectric resonator as disclosed above

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and to modify the invention by using an elliptical configuration for the electrode discloses for the purpose of suppress undesired spurious vibrations as disclosed by Wajima.

8. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita et al and Dydyk as applied to claim 5 above, and further in view of Kaida.

The combined piezoelectric resonator discloses all of the limitations above. However, the combined piezoelectric resonator does not disclose that the electrode is divided into a plurality of portions.

On the other hand, Kaida discloses for the purpose of ensuring enough bandwidth for a working piezo resonator, a main electrode 28c, can be divided into a plurality of portions (see figures 29, 31B)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to design the combined piezoelectric resonator as disclosed above and to modify the invention by dividing an electrode into a plurality of portions for the purpose of ensuring enough bandwidth for a working piezo resonator as disclosed by Kaida.

Response to Arguments

9. Applicant's arguments with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julio C. Gonzalez whose telephone number is (703) 305-1563. The examiner can normally be reached on M-F (8AM-5PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on (703) 308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 305-1341 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Jcg

April 25, 2002


NESTOR RAMIREZ
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